

REMARKS

Attached hereto is a marked-up version of the changes made to the application by this Amendment. Reconsideration and allowance of the subject application are respectfully requested.

Upon entry of this Amendment, claims 1-11 and 13-31 will be pending in the present application. Claims 1, 22, 30 and 31 are independent claims. Claims 1, 22, 30 and 31 have been amended by this Reply.

Examiner's Interview

Applicant conducted a telephonic interview with the Examiner on September 25, 2002. Particularly, the Applicant sought clarification of paragraph 8 (*Response to Arguments*) wherein the Examiner asserted that the features upon which Applicant relies (i.e., "prior to" any step that is designated as a step of etching) are not recited in the rejected claim(s).

In the interview, the Examiner reasserted the position taken in paragraph 6 (*Response to Arguments*) that Chen specifically points out a plasma treatment after the cycle the Applicant refers to, and prior to the metal etch cycle. The Examiner further asserted that this plasma treatment, which is clearly not an etching step, and which clearly occurs before the metal etch cycle, is the step of Chen relied upon for the rejection. The Examiner concludes that because no etching occurs during this plasma treatment, the rejection is maintained.

While Applicant urged upon the Examiner that at this present time the rejected claims include the recitation "prior to" a step of etching, the strength of the Examiner's position (as set forth in paragraph 8) is that the rejected claims do not recite prior to any step that is designated as a step of etching. Therefore, Applicant has amended the independent claims (1, 22, 30 and 31) to include this limitation. The Examiner agreed to give full consideration to the application, as amended.

Rejections Under 35 U.S.C. § 103

Claims 1, 2, 5-9, 11,13, 15, 16, 20-22, 24 and 28-31 stand rejected under 35 U.S.C. §103(a) over U.S. Patent No. 5,771,110 to Hirano et. al. (Hirano) in view of U.S. Patent No. 6,133,145 to Chen, and claims 10, 17-19 and 25-27 stand rejected under 35 U.S.C. 103(a) over Hirano and Chen (as applied to claims 1, 7, 22 and 30 in view of U.S. Patent No. 5,968,847 to Ye et al. (Ye). This rejection is respectfully traversed.

In the amendment filed on August 7, 2002, Applicant urged the Examiner to acknowledge the distinction between "etching" and "prior to etching." Applicant argued further that a point of contention here is whether lowering of a binding force occurs during a step of etching, or "prior to" any step that is designated as a step of etching.

While Applicant argued that the point of contention is whether lowering of a binding force occurs during a step of etching, or "prior to" any step that is designated as a step of etching, the Examiner has pointed out the word any is

not recited in the rejected claims. Applicant has amended independent claims 1, 22, 30 and 31 to include this limitation. Accordingly, Applicant respectfully submits that neither Hirano in view of Chen, nor Hirano and Chen in view of Ye discloses or suggests a combination of elements in a method of manufacturing a liquid crystal display device, including treating the exposed portion of the metal layer with a first plasma, prior to any step of etching said photoresist pattern, and prior to any step of etching said metal layer, using the photoresist pattern as a mask, to lower a binding force in the exposed portion, as recited in independent claim 1, and similarly stated in independent claims 22, 30 and 31.

Claims 2, 5-9, 11, 13, 15, 16, 20, 21, 24, 28 and 29 depend, either directly or indirectly, on claims 1, 22, 30 and 31. Since neither Hirano, nor Chen disclose or suggest the features of independent claims 1, 22, 30 and 31, Hirano, in view of Chen cannot render claims 1, 2, 5-9, 11-13, 15, 16, 20-22, 24 and 28-31 obvious to one of ordinary skill in the art.

Claims 10, 17-19, and 25-27, depend on claims 1, 22, and 30. Since neither Hirano, nor Chen, nor Ye discloses or suggests the features of independent claims 1, 22, and 30, Hirano and Chen in view of Ye cannot render claims 10, 17-19 and 25-27 obvious to one of ordinary skill in the art.

Reconsideration and withdrawal of these art grounds of rejection is respectfully requested.

Conclusion

Applicant considers all of the Examiner's comments to have been addressed and all of the Examiner's rejections overcome, thereby placing all claims pending in the present Application in condition for allowance. Accordingly, a Notice of Allowability is solicited in earnest.

In the event that any outstanding matters remain in this application, Applicant requests that the Examiner contact Percy L. Square (Reg. No. 51,084) at (703) 205-8034 to discuss such matters.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By 

Joseph A. Kolasch
Reg. No. 22,463


JAK/PLS:asc

P.O. Box 747
Falls Church, VA 22040-0747
(703) 205-8000

Attachments: Version With Markings to Show Changes Made

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In The Claims:

1. (Three Times Amended) A method of manufacturing a liquid crystal display device, comprising:

forming a switching element on a substrate;

forming a passivation layer over the substrate;

depositing a metal layer on the passivation layer;

forming a photoresist pattern on the metal layer, such that a portion of the metal layer is exposed;

treating the exposed portion of the metal layer with a first plasma, prior to any step of etching said photoresist pattern, and prior to any step of etching said metal layer, using the photoresist pattern as a mask, to lower a binding force in the exposed portion; and

etching the treated portion of the metal layer to form a pixel electrode.

22. (Three Times Amended) A method of patterning a metal layer, comprising:

depositing a metal layer over a substrate;

forming a mask on the metal layer, leaving a portion of the metal layer uncovered;

exposing the uncovered portion of the metal layer to a first plasma, prior to any step of etching said mask, and prior to any step of etching said metal layer, to lower a binding force in the uncovered portion; and

etching the uncovered portion of the metal layer with a second plasma to form a metal pattern.

30. (Twice Amended) A method of manufacturing a pixel electrode in a liquid crystal display device, comprising:

depositing a metal layer on a passivation layer which partially covers a transistor;

forming a photoresist pattern on the metal layer, leaving a portion of the metal layer uncovered;

exposing the uncovered portion of the metal layer to at least one first gas, prior to any step of etching said photoresist pattern and prior to any step of etching said metal layer, to lower a binding force in the uncovered portion; and

etching the uncovered portion of the metal layer with at least one second gas to form a pixel electrode.

31. (Amended) A method of manufacturing a pixel electrode in a liquid crystal display device, comprising:

depositing a metal layer on a passivation layer which partially covers a transistor;

forming a photoresist pattern adjacent to the metal layer, leaving a portion of the metal layer uncovered;

exposing the uncovered portion of the metal layer to at least one first gas, prior to any step of etching, to lower a binding force in the uncovered portion; and

etching the uncovered portion of the metal layer with at least one second gas to form a pixel electrode.

